Appl. No.: 10/630,129
Amdt. Dated: 08/05/05
Off. Act. Dated: 05/17/05

Amendments to the Specification:

Please replace paragraph [0007] with the following amended paragraph:

[0007] Current practice requires the entire video content stream (protocols, software modules, and/or the "stacks") to be torn down and rebuilt whenever source selection changes. This method was originally used for Internet streaming such as QuickTime and Real Networks. Later, this method was adopted and followed during the development of home media server products such as the NEC AX10, Pioneer DL-000, TiVo and Replay TV by SonicBlue.

Please replace paragraph [0012] with the following amended paragraph:

[0012] In one embodiment, the source control library includes a source route selection module to which a plurality of media sources, such as audio, visual, or audio/visual sources, are connected. The source route selection module selects which media source provides data to the stream controller. Preferably, the media sources include a plurality of analog video sources, an Ethernet streaming video source, and a hard disk drive ~~disk drive~~. In another embodiment, an iLink (IEEE-1394) connection can provide an additional video source. Other video sources can be included depending on the system requirements.

Please replace paragraph [0020] with the following amended paragraph:

[0020] FIG. 1A - 1B ~~FIG. 1~~ is a block diagram of a home media server system according to the present invention.

Appl. No.: 10/630,129
Amdt. Dated: 08/05/05
Off. Act. Dated: 05/17/05

Please replace paragraphs [0022] - [0030] with the following amended paragraphs:

[0022] Referring more specifically to the drawings, for illustrative purposes the present invention is embodied in the apparatus generally shown in FIG. 1A - 1B ~~FIG. 1~~ through FIG. 2 and related method(s) of operation. It will be appreciated that the apparatus may vary as to configuration and as to details of the components, and that the method may vary as to the specific steps and sequence, without departing from the basic concepts as disclosed herein.

[0023] FIG. 1A - 1B ~~FIG. 1~~ illustrates a home media server system that is generally designated 10. As shown, the system 10 includes a source control library 12 connected to a stream controller 14. In turn, the stream controller 14 is connected to a streaming library 16. FIG. 1A - 1B ~~FIG. 1~~ further shows that the streaming library 12 is also connected to a network 18, such as a local area network (LAN), a wireless local area network (WLAN), a wide area network (WAN), a wireless wide area network (WWAN), a personal area network (PAN), a wireless personal area network (WPAN), or any other network known in the art. As shown, a plurality of network display terminals (NDT) 20 are connected to the network. It can be appreciated that each NDT 20 can be a television, a computer monitor, or any other display device. As described in detail below, it is to be understood that the stream controller 14 can select a streaming module to be used for streaming a video signal to an NDT 20.

[0024] As shown in FIG. 1A - 1B ~~FIG. 1~~, the source control library 12 includes a plurality of analog video decoders 22 that are connected to an analog source router multiplexer (MUX) 24. The analog source router MUX 24, in turn, is connected to a plurality of digital compression encoders 26 which are connected to a source route selection (SRS) module 28. Further, an Ethernet streaming video interface 30 is connected to the SRS module 28. A personal video recorder (PVR)/file playback module 32 is also connected to the SRS module 28.

It is to be understood that the SRS module 28 handles source selection, source switching, and routing of digital data to a streaming module interface package, described below.

[0025] FIG. 1A - 1B ~~FIG. 1~~ also shows a plurality of analog video sources 34 that provide analog video signals to respective analog video decoders 22. The analog video decoders 22 convert the analog video signals to digital video signals that are input to the analog source router MUX 24. As shown, the analog source router MUX 24 can be controlled by a source selection application program interface (API) provided by the SRS module 28. FIG. 1A - 1B ~~FIG. 1~~ further shows that the analog source router MUX 24 supplies data signals to the digital compression encoders 26. Each digital compression encoder 26 compresses the signals and sends compressed data signals to the SRS module 28. Preferably, the digital compression encoders 26 can be controlled by an encoder control API from the SRS module 28.

[0026] In a preferred embodiment, an Ethernet streaming video source 36 provides an Ethernet streaming video signal to the Ethernet streaming video interface 30 which converts the Ethernet streaming video signal to a compressed digital video data signal and sends the data signal to the SRS module 28. The SRS module 28 can control the Ethernet streaming video interface 30 using an Ethernet streaming video control API that is sent to the Ethernet streaming video interface 30. As further shown in FIG. 1, a hard disk drive such as an audio/visual hard disk drive (AV HDD) 38 can provide a compressed digital video data signal to the PVR/File playback module 32. Preferably, the PVR/file playback module 32 sends a compressed digital video data signal to the SRS module 28. Operation of the PVR/file playback module 32 can be controlled by a PVR control API sent to the PVR/file playback module 32 by the SRS module 28. It can be appreciated that other sources can provided content to the SRS

module 28. For example, these sources can include an iLink source, a memory stick, an audio/visual (AV) source, or any other media source.

[0027] Still referring to FIG. 1A - 1B ~~FIG. 1~~, the stream controller includes a streaming module interface package 40. A universal plug and play (UPnP) 42 software stack is connected to the streaming module interface package 40. As shown, stream requests are sent between the streaming module interface package 40 and the UPnP software stack 42. Moreover, the streaming module interface package 40 provides a SRS module control API that can be used to control the SRS module 28. The SRS module 28 provides a data signal to the streaming module interface package 40. As described in detail below, the data signal eventually gets packetized and sent along to one or more of the NDTs 20.

[0028] As shown in FIG. 1A - 1B ~~FIG. 1~~, the streaming library 16 includes a real time streaming protocol/real time transport protocol (RTSP/RTP) streaming module 44, a hypertext transfer protocol (HTTP) streaming module 46, and a user datagram protocol (UDP) streaming module 48. Each of these modules 44, 46, 48 are connected to the streaming module interface package 40. Specifically, the RTSP/RTP streaming module 44 receives a data signal and an RTSP/RTP API from the streaming module interface package 40. Moreover, the HTTP streaming module 46 receives a data signal and an HTTP API from the streaming module interface package 40. Also, the UDP streaming module 48 receives a data signal and an UDP API from the streaming module interface package 40.

[0029] It is to be understood that, in a preferred embodiment, the streaming module interface package 40 uses these APIs to control the respective modules to which they are sent, i.e., the RTSP/RTP streaming module 44, the HTTP streaming module 46, and the UDP streaming module 48. Further, in a preferred embodiment, each compressed digital video data signal received at the RTSP/RTP streaming module 44, the HTTP streaming module 46, and the UDP

streaming module 48 is packetized and time stamped to yield a packet stream that can then be sent, or streamed, to one or more of the NDTs 20 via the network 18 using a selected internet protocol (IP), as described below.

[0030] FIG. 1A - 1B ~~FIG. 1~~ further shows that the RTSP/RTP streaming module 44, the HTTP streaming module 46, and the UDP streaming module 48 are connected to the network 18. As shown, RTSP/RTP commands can be sent between the RTSP/RTP streaming module 44 and one or more of the NDTs 20 via the network 18. Additionally, a packet stream, containing packetized data, can be sent from the RTSP/RTP streaming module 44 to one or more of the NDTs 20 via the network 18. Preferably, HTTP commands can be sent between the HTTP streaming module 46 and one or more of the NDTs 20 via the network 18 and a packet stream can be sent to one or more of the NDTs 20 from the HTTP streaming module 46. Moreover, UDP commands can be sent between the UDP streaming module 48 and one or more of the NDTs 20 via the network 18 and a packet stream can be sent to one or more of the NDTs 20 from the UDP streaming module 48. As further shown in FIG. 1, UPnP commands can be sent between the UPnP software stack 46 and one or more of the NDTs 20 via the network 18. It is to be understood that universal resource locators (URLs) can be obtained through UPnP commands from the NDTs 20 and can then be returned to the NDTs 20 via RTSP/RTP or other requested streaming protocol, i.e., HTTP or UDP.